

OPINION

On occasion of the competition for occupation of the academic position "Associate Professor" in professional field 5.2 Electrical Engineering, Electronics and Automation, specialty "Theory of electronic circuits and electronic circuitry",

announced in the State Gazette No. 31 / 12.04.2019

with the candidate: Senior Assistant Professor, Sotir Ivanov Sotirov, PhD

Member of the Scientific Jury: Professor Anatoliy Trifonov Aleksandrov, PhD, (according to Ordinance of the Rector of Plovdiv University Paisii Hilendarski No. P33-2887 of 11th June 2019).

1. General description of the candidate's research and applied work

In the competition for the academic position "Associate Professor" Senior Assistant Professor Sotir Ivanov Sotirov, PhD participates with 26 scientific papers - 1 monographic work and 25 publications, outside the dissertation, of which 16 scientific publications (1, 3-10, 13-16, 19-21) in publications, referenced and indexed in world-renowned databases of scientific information (Scopus, Web of Science), and 9 scientific publications (2, 11, 12, 17, 18, 22-25) in non-referenced scientific reviewed journals or in edited joint papers.

The monograph is entitled "Computer Measurements of Physical Quantities," ISBN 978-619-7536-00-3. It is 179 pages long, published by Koala Press and meets the requirements for a monograph.

The publications can be classified as follows:

- articles in collections of international conference in Bulgaria - 2 [13, 15];
- articles in collections of international conferences and symposia abroad – 6 pieces [4, 6, 7, 11, 12, 16];
- articles in reviewed scientific journals and yearbooks - 17 issues [1-3, 5, 8-10, 14, 17-25].

The candidate's individual works are 2 [24, 25], and 23 of the works are with two or more co-authors (1-23). In 4 of the works, the candidate comes first (5, 13, 14, 15). There are 21 publications in English [1-21] and 4 publications [22 - 25] in Bulgarian.

The candidate covers and on certain criteria exceeds the minimum national requirements by certain indicators. He has defended a dissertation on the topic: "Impulse laser deposition of organic dyes and study of the obtained thin layers" (indicator A - 50 points). He has presented a monographic work (index B - 100 points), 25 scientific publications (group of indicators D - 202.66 points), of which 16 scientific publications are in publications that are referenced and indexed in world-famous databases of scientific information, and 9 scientific publications in non-referenced scientific reviewed journals or in edited collective works, 8 citations (group of indicators D - 72 points), of which 7 citations in scientific journals, referenced and indexed in world-renowned scientific information databases, and 1 citation in non-referenced scientific reviewed journal.

Senior Assistant Professor Sotir Sotirov has participated in five scientific and research projects as a member of the scientific team: two projects under the Scientific Research Fund at the PU Paisii Hilendarski - Plovdiv (FP17-FF-010/2017, NI15-FFIT-005/2015); one – under Scientific Research Fund at the Ministry of Education and Science (DFNI-B-02/7/2014); one - under the OP Improving the competitiveness of the Bulgarian economy 2013-2014 (BG161PO003-1.2.04-0012-C0001/2013); one - under the Program FP7 (REGPOT-BioSupport).

2. Assessment of the candidate's pedagogical background and work

Sotir Sotirov was appointed at the academic post of Assistant Professor in the ECIT Department of Plovdiv University Paisii Hilendarski in 2012, and since 2015 he has been Senior Assistant Professor at the Department.

According to the information provided by the management of the Faculty of Physics and Technology at Plovdiv University Paisii Hilendarski, a teaching load of at least 120 hours of lectures is assigned per academic year in the following disciplines: "Analogue Circuit", "Digital Circuit", "Optoelectronics", and "Electrical engineering and Electronics". The candidate in the competition has prepared the curricula of these disciplines.

The above data give me reason to evaluate the candidate's pedagogical background and activity as very good.

3. Main research and applied contributions

I accept the formulated contributions of the works presented. They are scientifically applied and are related to proving with new means of significant new aspects of existing scientific problems and obtaining confirmatory facts in the field of electronic circuit theory and electronic circuitry.

5.1. Contributions of the monograph work

The main theoretical and practical aspects of the design and construction of computerized measurement systems are presented. The role of microcontrollers in the design of measuring devices is discussed in detail. Attention is drawn to the main digital interfaces for communication between microcontrollers and the specialized digital integrated circuits through which measurements are made.

Basic block diagrams of specially designed programs for visualization and mathematical processing of the obtained results, as well as their user interfaces, are presented. An in-depth analysis of the design and sizing of the main modules and units is made, the electrical circuits of the devices are presented.

5.2. Contributions of the publications

- The obtained polyelectrolyte multilayer structures of natural polymers are characterized. Their morphology and topology are defined. The chemical composition of the samples was analysed by infrared spectroscopy [1-4, 6-8, 10].
- A new type of ammonia sensor has been created based on a composite film between polyaniline and poly lactic acid. The electrical resistance of the sensor at constant humidity and different concentrations of ammonia was measured. An increase in ammonia concentration has been found to increase resistance [5].
- A device for the precise measurement of the piezoelectric coefficient in thin layers has been constructed, and measurements of piezoelectric ceramics samples (PZT) and polymer films of polytetrafluoroethylene (PTFE) and polyethylene terephthalate (PET) have been performed. The experimental results show that the proposed device works accurately and can be successfully used for educational and scientific purposes [11, 12].
- Thin layers of metal oxides (Mox) and diamond-like carbon were created and investigated using the pulsed laser deposition method. The morphology of the thin Mox layers as well as the deposition rate were found to be highly dependent on the laser operating mode.
- Hybrid inorganic-organic nanocomposite coatings have been obtained and tested through a new modification of the pulsed laser deposition technology.
- A wireless microprocessor system for measuring the power and current-voltage characteristics of photovoltaic panels has been developed and tested [13,14]. A specialized software for personal computer has been developed through which the characteristics of photovoltaic panels can be visualized, investigated and analysed.
- A microprocessor-based surface potential measurement system based on the EFS-22D sensor has been developed with a measuring range from 0 V to 900 V at a distance between the sample and the probe surface from 1 mm to 3.5 mm. The measurement uncertainty in the operating range is 500mV. A user software has been developed that

allows you to: record the measured values obtained; their visualization in digital and graphic form; digital filtering of sensor noise and statistical analysis of the data obtained [15,18].

- A wireless microprocessor system has been developed to measure temperature in the range from 0°C to + 1023.75°C with a separating capacity of 0.25°C. The system is capable of compensating at the cold end of a K type thermocouple in the temperature range from -20°C to + 85°C with an accuracy of +/- 3°C. A personal computer software has been developed [24].
- An on-board vehicle diagnostics system has been developed. The resulting digital data from the vehicle's electronic unit is transmitted to the smartphone via a Bluetooth module, where they are displayed in a user-friendly manner [25].

4. The importance of contributions to science and practice

An evaluation of the candidate's recognition in the scientific community are the citations given in the documents submitted to the competition. A list of 8 citations is presented, of which 7 citations are in referenced and indexed scientific publications in world-famous scientific information databases.

This provides to me the grounds to conclude that the candidate is a well-known author who has published works in significant scientific journals, and collections in the field of the competition.

The quantitative indicators for the occupation of the academic position “Associate Professor” at Plovdiv University Paisii Hilendarski, and the minimum national requirements have been met.

5. Critical notes and recommendations

I did not find any significant gaps in the candidate's written works. I believe that the contributions can be summarized.

I would recommend the candidate to publish his own independent articles, and articles with IF.

CONCLUSION

In conclusion, I can give a positive assessment of the whole research and pedagogical activity of Senior Assistant Professor Sotir Sotirov, PhD, who fully meet the requirements for occupying the academic position of "Associate Professor". Sufficient and significant scientific contributions have been made.

On the basis of my acquaintance with the presented scientific works, on the basis of their importance and the scientific and applied contributions contained therein, I find it justifiable to propose Senior Assistant Professor Sotir Sotirov, PhD to take the academic position of Associate Professor in the professional field 5.2 Electrical Engineering, Electronics and Automation, in specialty, “Theory Electronic Circuits and Electronic Circuitry”.

Date: 05/09/2019

JURY MEMBER:

/ Professor A. Aleksandrov /